SK SATO

Instruction Manual

No. 8191-00 4-ch Datalogger

Model SK-L400T

(Temperature measurement type)

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https://www.sksato.co.jp/en/

T.11

This product is designed to measure temperature connecting K-type thermocouple probes. Do not use it for other purposes. Read this manual thoroughly before using the product and keep the manual in a safe place for future reference whenever necessary.
Check if the product is not damaged during transportation first.
If it is damaged, contact us or the retailer from which it was purchased.

Warning

SK-L400T is not explosion-proof. Never use it in an atmosphere containing flammable gases.

Beware of explosion!

There is a risk of explosion. Take extreme care.

Warnings on Usage

For your safety and proper use of the SK-L400T, be sure to observe the following:

- Never disassemble or modify the unit. Doing so may cause a malfunction.
- The unit is precision-machined. Never drop the unit or knock it over.
- Do not use the unit in a place exposed to direct sunlight or near a heat source. Doing so affects the measurement accuracy, and could result in a deformation or malfunction of the unit.
- If this unit is used in an environment where electrical noise is generated, the display may become unstable or the measurement error may increase.
- The main unit and sensor are not waterproof. Never let them get wet.
- Measuring temperatures outside the measurable range may result in unit and/or sensor malfunctions.
- If the unit is not to be used for a long period of time, remove the batteries. Otherwise, the batteries may leak, resulting in malfunctions.
- Do not dispose of used batteries in a fire.
- Keep the battery out of the reach of children. If the battery has been swallowed accidentally, consult a doctor immediately.
- For environmental conservation purposes, dispose of the used battery in compliance with local rules and regulations.
- Do not wash or wipe this unit with alcohol, thinner, or other organic solvents. If the unit becomes dirty, wipe it with a tightly-wrung gauze or the like that has been dipped in warm water with neutral detergent.

For repair or calibration, contact us or the retailer from which the Datalogger was purchased.

Overview

This temperature datalogger uses K-type thermocouple sensor. Four probes can be connected at the same time, and four channels can be displayed on the large LCD.
An SD card is used as the recording medium.

Features

- Measure the temperatures of four locations at same time.
  Up to four K-type thermocouple probes can be connected. Simultaneously displays four temperatures from four locations (channels) on the large LCD for easy reading. By using the ASTM (former ANSI) miniature connector for the K-type thermocouple, various optional sensors can be connected.

- Logging the measured values on the SD card
  The measured values can be logged on the SD card installed in the unit.
  By using the analysis software "4ch DATALOGGER for Windows" included with the unit, graph plotting and data analysis can be easily done.

- Manual logging, preset logging, memo function
  Equipped with manual logging, preset logging that enables you to set the time at which to start or stop logging, and a memo function for quickly logging the current measured value. Can be used for various data collection operations.

- Alarm issuance at upper and lower limit temperatures
  Different alarm values (upper and lower) can be set for the four channels. If the measured value goes out of the set limit value, a buzzer sounds and the LED lamp flashes to alert.

- Display of various calculation results
  Display of the maximum (MAX) or minimum (MIN) value, relative value (REL function), temperature difference (T1 – T2 function), offset function.

- Backlight function: The backlight makes it easy to read in dark places.

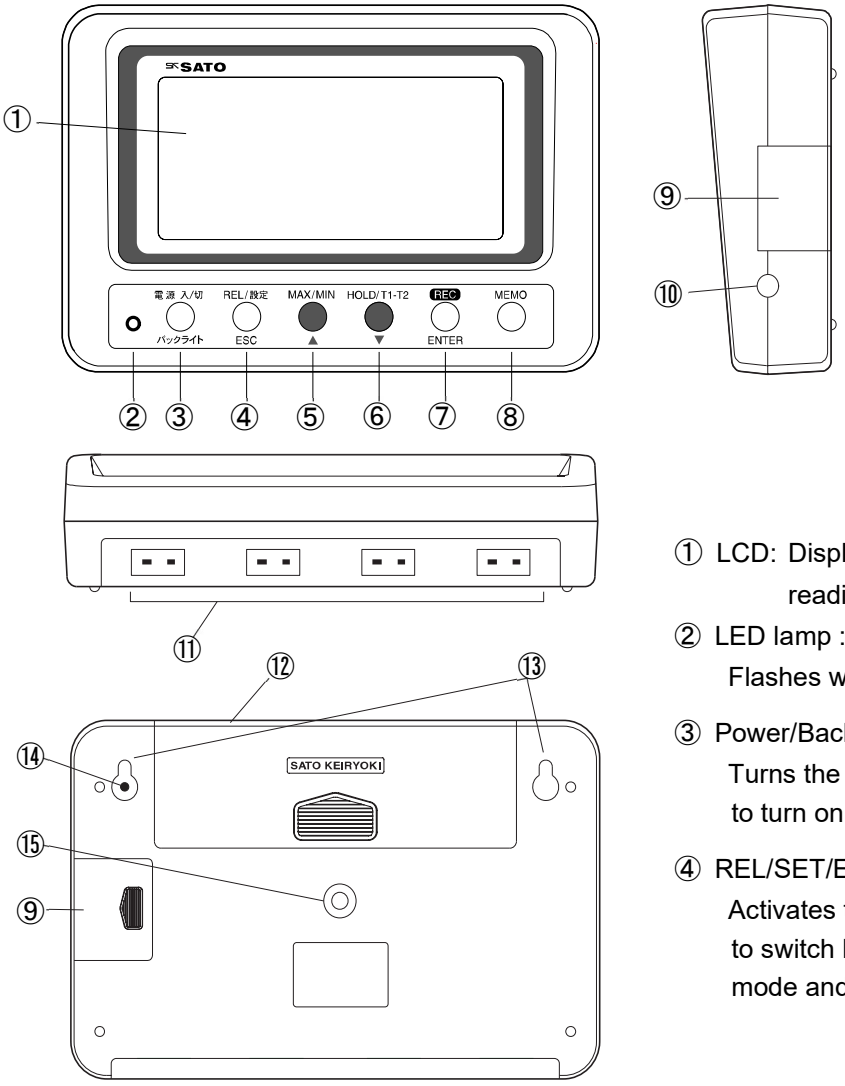
- Mounting on a tripod
  The threaded hole on the back of the unit makes it easy to mount the unit on a tripod.

Before use

Check whether the unit was damaged during shipping.
If it is damaged, contact us or the store where you purchased the unit.

Names of components

● Main unit



① LCD: Displays the temperature reading and state of the unit.

② LED lamp :
Flashes while the alarm is sounding.

③ Power/Backlight key :
Turns the power on or off. Also used to turn on the backlight.

④ REL/SET/ESC key :
Activates the REL function. Also used to switch between the measuring mode and setting mode.

⑤ MAX/MIN/▲ key : Switches between MAX and MIN. Advances the items or values in the setting mode. Also used to turn on or off the display of current logging.

⑥ HOLD/T1 – T2/▼ key : Freezes (holds) the measured value. Also used to switch between T1 and T2. Resumes the items or values in the setting mode.

⑦ REC/ENTER key : Starts logging. Confirms the values in the setting mode.

⑧ MEMO : Activates the MEMO function.

⑨ Lid of SD card slot : The SD card is inserted under this lid.

⑩ AC adapter terminal : Terminal to which the AC adapter is connected

⑪ Thermocouple terminal : Terminal to which the thermocouple sensor is connected. From left to right, channels 1, 2, 3, and 4.

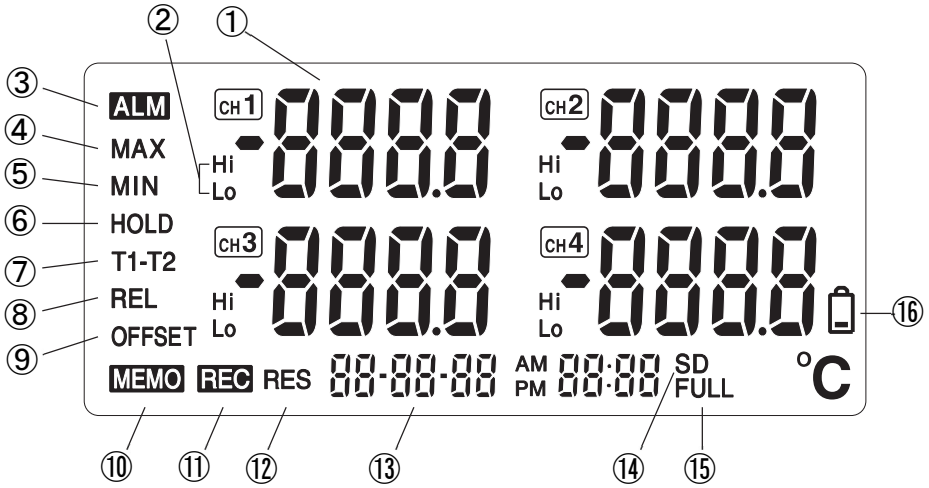
⑫ Lid of battery compartment : The batteries are installed under this lid.

⑬ Hook hole for wall mounting : Used to hang the unit on the wall

⑭ Reset button : Resets the error state.

⑮ Tripod mounting hole : Threaded hole for mounting on a tripod

● Display



① Temperature display
: Displays the measured temperature value. Displays various setting options in the setting mode.

② Hi/Lo : Displays if the value exceeds/falls short of the alarm set value.

③ ALM : Lights up when the alarm is on.

④ MAX : Lights up when the maximum value (MAX) is displayed.

⑤ MIN : Lights up when the minimum value (MIN) is displayed.

⑥ HOLD : Lights up when the display is frozen (held).

⑦ T1 – T2 : Lights up when T1 – T2 is displayed.

⑧ REL : Lights up when REL is displayed.

⑨ OFFSET : Lights up when the offset is on.

⑩ MEMO : Lights up when the memo is on.

⑪ REC : Lights up during logging.

⑫ RES : Lights up during preset standby.

⑬ Clock display : Display the year, month, date and time.

⑭ SD : Lights up when the SD card is inserted.

⑮ FULL : Lights up when there is no free space on the SD card.

⑯ Low battery indicator : Lights up if the battery level becomes low.

Installing the batteries

1) Turn the power off.

2) Remove the lid of the battery compartment by sliding it.

3) Remove the old batteries, then install four new batteries (AA size) with their polarities aligned correctly.

4) Slide the lid into the unit until a "click" is heard to secure it.

Note: * Although the clock setting is designed to be retained for approximately one minute even during battery replacement, it could be reset due to static electricity or environmental conditions.

* Upon battery replacement, check the clock setting.

* Other settings such as the logging interval are retained.

⚠ Attention!

- When the low battery indicator lights up, immediately replace the batteries with new ones.
- All four batteries must be new and of the same type. Using a combination of different types or old and new ones could cause rupture or fluid leakage.
- To protect the environment, dispose of used batteries in compliance with local rules and regulations.

Using the AC adapter

The AC adapter (optional) can be used as the power source for the unit.
Insert the AC adapter plug into the AC adapter terminal.

* The unit can be used either with the AC adapter or batteries.
  Using the AC adapter for power supply with the batteries installed guarantees uninterrupted operation even when the power fails or the AC adapter is accidentally disconnected, as power will be automatically supplied from the batteries on such occasions.
* When both the AC adapter and the batteries are used, the AC adapter normally takes precedence over the batteries.

  Note: The batteries steadily run down due to the operating conditions or self-discharge. Since the low battery indicator does not function when both the AC adapter and batteries are used, regularly check the battery level and replace the batteries as needed.

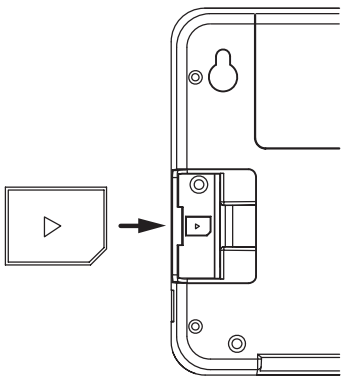
Installing the SD card

The measured values are logged onto the SD card in the unit.
The logged data can be read by a PC via an SD card reader, and the provided analysis software can be used to create and print graphs plotted from the data.
NB: An SD card reader is not provided with the unit; please buy one on the market.

● Installing the SD card

1) Turn off the power, and remove the lid of the SD card slot by sliding it.
2) Insert the SD card in the positioning shown on the case.
   Push the card into the slot until a "click" is heard.
   Note: If inserted in the wrong direction, the card or connection terminal on the unit could be damaged.
3) Slide the lid into the unit to secure it until a "click" is heard.
4) Turn on the power. The SD character appears on the display.
   * If the SD character is not lit, it means that the card is not recognized. If this occurs, remove the card and reinstall it.

   Note: The unit cannot recognize the SD card if it is set to write-protect (lock). Release the write-protect before using it.



* If the SD character is flashing, it indicates that there is not enough free space. (It flashes when the free space of the SD card falls below approximately 10MB.)
  If the FULL character is lit, it indicates that there is no free space. Free up some space and reinstall the SD card.

● Removing the SD card

1) Turn the power off.
2) Remove the lid of the SD card slot from the back of the case by sliding it.
3) Push the SD card to the far end until a "click" is heard, then the spring fitted inside pushes out the card.
4) Remove the SD card by pulling it straight out.
5) Slide the lid into the unit until a "click" is heard to secure it.

● About the SD card

In addition to the SD card provided, you can use a commercial SD or SDHC card of 1 to 8 GB in the unit. Use a formatted SD card.

* NTFS cannot be used in the unit.
* We have verified the operation of the following SD cards:

SanDisk	2GB	"SDSDB-2048-J95B"
	4GB	"SDSDB-4096-J95A" (comes with the product, formatted)
Panasonic	2GB	"RP-SDL02GJ1K"
Transcend	2GB	"TS2GSDC"

⚠ Attention!

- We recommend using the provided SD card or one of the types verified by us. Using an SD card other than these could result in a recognition error.
- Do not remove the label stuck to the SD card, nor attach any labels or stickers to it.
  Before connecting or disconnecting the SD card, be sure to turn off the power of the unit.
  Connecting or disconnecting the SD card while the power is on could result in failure of the unit or the SD card, as well as loss of or damage to the data.
- We recommend backing up any data on the SD card to a device such as a PC.
  Note that we are not responsible for any loss of or damage to data on the SD card.

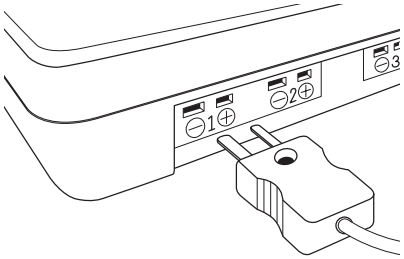
Installing the probe

The probes with K-type thermocouple sensor can be connected to the unit.
If you use probes other than those recommended by us, be sure to use the ASTM (former ANSI) miniature connector for the K-type thermocouple.

Note: The unit is designed to be used with the K-type thermocouple. Temperatures cannot be measured properly if a probe other than the K-type thermocouple or a connecter other than for the K-type thermocouple is used.

● Installing the probe

1) Turn the power off.
2) Connect the K-type thermocouple probe to the channel to be used. Hold the connector and insert the plugs all the way into the terminals with the correct polarities.



● Removing the probe

1) Turn the power off.
2) Remove the probe by holding the connector and pulling it straight out.

Note: Do not pull the probe by holding and pulling the sensor cord. Doing so could break the cord.

Measuring temperature

1) Press and hold the [Power] key for at least two seconds to turn on the power. The LED lamp and all indicators light up for approximately one second to indicate that the measurement mode is established.

Note: The display of "– – – – –" appears in the channel to which no sensor is connected.

2) Press and hold the [Power] key for at least two seconds to turn off the power.

⚠ Attention!

- If the ambient temperature rapidly changes, the measurement accuracy may be affected. Before starting measuring, allow the unit to adjust fully to the ambient temperature.

1. HOLD function

Use the HOLD function if there are large variations in measurement results during measurement.

● Operation

1) Press the [HOLD] key in the measurement mode.
   The **HOLD** character lights up to indicate that the measured value is held (frozen).
2) Press the [HOLD] key again to cancel.
   The **HOLD** character goes off to indicate that the measurement mode is resumed.

2. MAX/MIN function

The unit can memorize the values measured since power-on, and display the maximum value (MAX) and minimum value (MIN) among them.

● Operation

Every time the [MAX/MIN] key is pressed in the measurement mode, the values of maximum, minimum and measured of each channel are toggled in this order.

In addition, the **MAX** or **MIN** character lights up in the display.

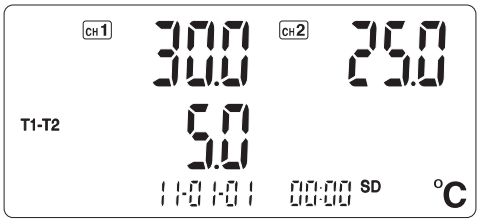
Note: When the **T1 – T2** or REL function is used, the maximum or minimum value up to that time is cleared and the new maximum or minimum value logged since the **T1 – T2** or **REL** function was selected is displayed. The maximum or minimum value is also cleared when the power is turned off.

3. T1 – T2 function

This function is used to display the value (temperature difference) obtained by subtracting the measured value of channel 2 (CH2) from the measured value of channel 1 (CH1).

● Operation

1) Press and hold the [T1 – T2] key for at least two seconds in the measurement mode. The **T1 – T2** character lights up to display the value obtained by subtracting the measured value of channel 2 from the measured value of channel 1.
   Note that the measured values of channels 3 (CH3) and 4 (CH4) are not displayed even if they are installed.



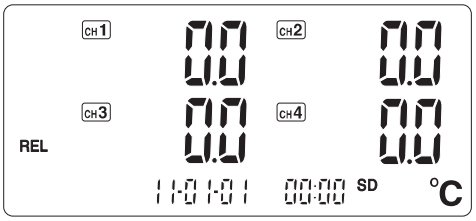
2) To cancel, press and hold the [T1 – T2] key again for at least two seconds.
   The **T1 – T2** character goes off to indicate that the measurement mode is resumed.

4. REL function

The relative value (change in measured values) relative to the current measured value (set to 0.0°C) can be viewed.

● Operation

1) Press the [REL] key in the measurement mode.
   The **REL** character lights up and the measured value of each channel is displayed as "0.0°C".
   * Note that an error is displayed if a probe is not connected to the particular channel.



2) Press the [REL] key again to cancel.
   The **REL** character goes off to indicate that the measurement mode is resumed.

Logging function

The unit logs (stores) the measured values on the SD card at the preset interval. There are two types of logging (manual logging and preset logging).

1. Logging operation

・Once the logging is started, an ska format file to save logging data is created on the SD card.
The saved data can be used for plotting graphs, calculating the accumulated temperature and printing with the analysis software "4ch DATALOGGER for Windows" that comes with the unit.

* The "4ch DATALOGGER for Windows" software can be used to convert an ska file to a CSV

format file. Use the CSV format file if the data is going to be analyzed using a commercial spreadsheet program.

The file name is created using the date and time the measurement starts.

File name structure: [AA BB CC DD .ska]
Month Date Hour Minute

Example: Sep. 11, 10:15
File name: [09111015.ska]

・Up to 30,000 data items (for each channel) are stored in a file.
When there are more than 30,000 data items, a new file is created to continue logging.
This new file is named using the date and time it is created.

・If the **SD** character is off, or if the **FULL** character or the low battery indicator is on, it is not possible to start logging or to set the preset logging.

Note: The logging continues until the battery is exhausted even if the low battery indicator lights up during logging. If this occurs, immediately replace the batteries. If continue logging is required, switch to the power supply from the AC adapter.

・If you start logging when any of the functions MAX/MIN, HOLD, T1 – T2, or REL has been activated, logging is performed upon cancelling each function. These functions are disabled during logging.
If the offset value has been set, the values reflecting the offset value are logged.

・The display of measured values can be turned on or off during logging.
Use the [MAX/MIN/▲] key to turn the measured value display on or off.
* Note that displaying the measured values consumes a lot of power and shortens the battery life. The display of measured values should be turned off unless necessary.

・It is not possible to turn off the power during logging. The auto power-off function is disabled during logging. To turn off the power, first stop logging, and then turn it off.

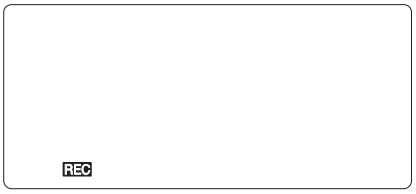
2. Manual logging

The logging starts when the key is pressed and continues at the logging interval that has been set.

1) Setting the logging interval

Set the logging interval by referring to "Setting the logging interval" on page 14.

2) Press and hold the [REC] key for at least two seconds in the measurement mode.
The measured value goes off, the REC character lights up and logging starts.



3) To stop logging, press and hold the [REC] key for at least two seconds.
The REC character goes off to indicate that the measurement mode is resumed.

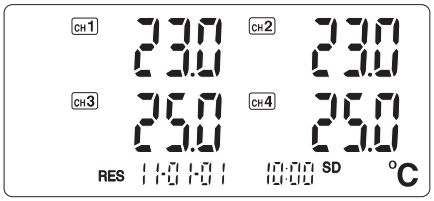
3. Preset logging

This function automatically starts or stops logging at the preset date and time.

1) Setting the logging interval
Set the logging interval by referring to "Setting the logging interval" on page 14.

2) Setting the preset start or stop date and time
Set the date and time by referring to "Setting the preset logging" on page 14.

3) Upon completion of setting the preset start date and time, press and hold the [ESC] key for at least two seconds.
The RES character lights up to indicate that the preset logging standby mode is established.



[Operation in the preset standby mode]

・The display of measured values can be turned on or off in the preset standby mode.
Use the [MAX/MIN/▲] key to turn the measured value display on or off.

* Note that displaying the measured values consumes a lot of power and shortens the battery life. The display of measured values should be turned off unless necessary.

・The functions of MAX/MIN, HOLD, T1 – T2, REL and MEMO are disabled.

・Pressing and holding the [REC] key for at least two seconds cancels the standby mode and starts logging.

・Turning off the power also cancels the standby mode.

4) The logging automatically starts when the preset start date and time is reached.
* The logging starts even when the low battery indicator lights up during the preset standby mode.

5) To stop logging, press and hold the [REC] key for at least two seconds.
The REC character goes off to indicate that the measurement mode is resumed.
If the preset stop date and time has been set, the logging stops when the stop date and time is reached.

MEMO function

This function is used to make a memo of the current measured value.

There are two types when making a memo: one-time data memo and continuous data memo.

[Memo operation]

・The measured values are saved on the SD card as a text format file.

When the MEMO function is used for the first time, the file [SK001.TXT] is created. Every time a memo is made thereafter, data is added to the next line.

Note: The file saved by the MEMO function can be analyzed using a commercial spreadsheet program.

However, the software program "4ch DATALOGGER for Windows" that comes with the unit cannot be used for analyzing the file.

Data Format

MN/AT	date	time	int	1ch	2ch	3ch	4ch	unit
MN	2011/1/2	12:55:21		155.5	300.5	658.4	1357	C
MN	2011/1/2	13:55:54		155.1	300.1	653.2	1341	C
MN	2011/1/4	14:54:48		154.9	299.5	640.2	1256	C

MN : MEMO function

Interval : Blank space

Unit : C (°C)

・The MEMO function cannot be used when the **SD** character is off or when the **FULL** character or the low battery indicator is lit.

・If the [MEMO] key is pressed when any of the functions MAX/MIN, HOLD, T1 – T2, or REL has been activated, logging is performed upon cancelling each function.

* If the offset value has been set, the values reflecting the offset value are logged.

● One-time data memo

The measured value at the time when the [MEMO] key is pressed is logged on the SD card.

1) Press the [MEMO] key in the measurement mode.
   The MEMO character stays lit for five seconds to indicate that the measured value is being logged.
2) Upon completion of logging of the measured value, the measurement mode is resumed.

● Continuous data memo

The measured values are logged as long as the [MEMO] key is kept pressed.

In the continuous data memo, the measured values are logged at two-second intervals.

1) Press and hold the [MEMO] key in the measurement mode.
   The MEMO character lights up to indicate that the measured values are being logged.
2) To stop logging, release the [MEMO] key. The MEMO character goes off to indicate that the measurement mode is resumed.
   Note: The auto power-off function is enabled during the continuous data memo function.
   If the continuous data memo function is going to be used for 20 minutes or more, cancel the auto power-off function, by referring to "Auto power-off function" on page 18, before starting the memo function.

Various settings

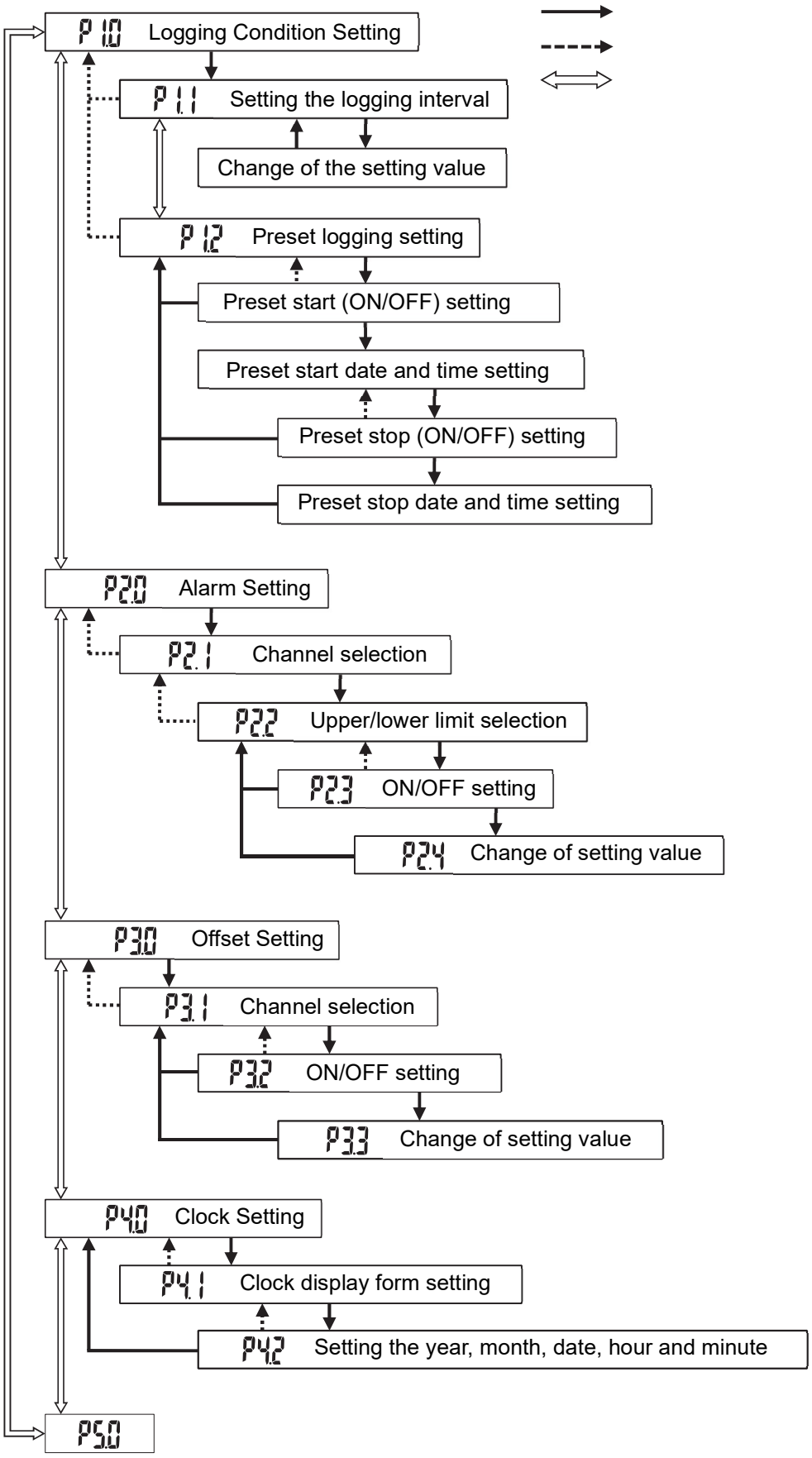
The following settings can be made in the setting mode.

No.	Character	Description
P10	rEc	Sets the logging conditions.
P20	AL	Sets the alarm function.
P30	oFSt	Sets an offset to the measured values.
P40	dAt	Sets the clock.

● Setting mode operation

1) Press and hold the [SET] key for at least two seconds in the measurement mode.
   In the temperature display section, the P10 character lights up to indicate that the setting mode is established.
2) Use the [▲] or [▼] key to select the desired setting items and press the [ENTER] key to confirm.
3) To end the setting mode, press and hold the [ESC] key for at least two seconds to resume the measurement mode.

● Flow chart of Setting mode

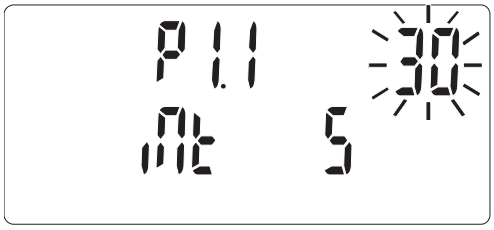


P10 Logging conditions setting

● Setting the logging interval

Set the interval at which the measured values are to be logged.

1) Select the P10 logging conditions setting, and then press the [ENTER] key.
2) Use the [▲] or [▼] key to select the P11 logging interval setting, and then press the [ENTER] key.
   The setting value edit screen appears, and the setting value starts flashing.

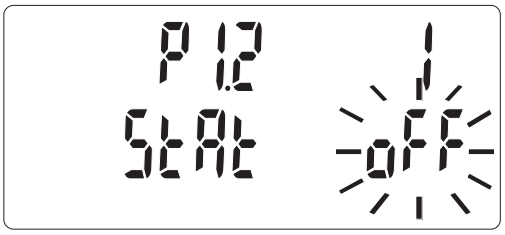


3) Use the [▲] or [▼] key to select the desired logging interval, and then press the [ENTER] key to confirm.
   The S character indicates the second and the mn character indicates the minute.

● Preset logging setting

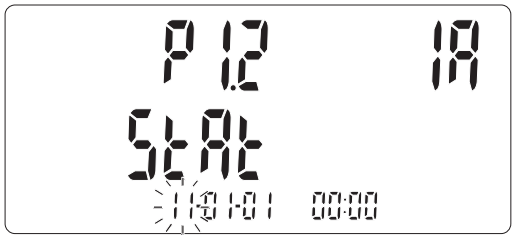
The preset logging function automatically starts or stops logging when the preset time is reached.

1) Select the P10 logging conditions setting, and then press the [ENTER] key.
2) Use the [▲] or [▼] key to select the P12 preset logging setting, and then press the ENTER key.
   The ON or OFF selection screen of the preset start function appears.

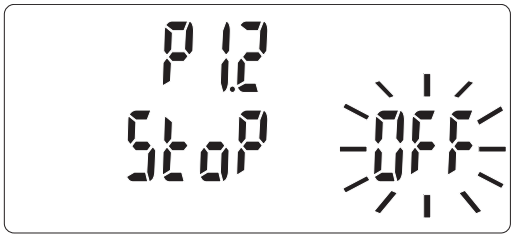


3) Use the [▲] or [▼] key to select "ON", and then press the [ENTER] key. The start date and time setting display appears.
4) Set the start date and time in the order of year, month, date, hour and minute. Use the [▲] or [▼] key to select the value, and then press the [ENTER] key to confirm. For setting the year, use the lower two digits.

   Note: If the preset start date and time is set earlier than the current date and time, an error occurs and the year setting is resumed.

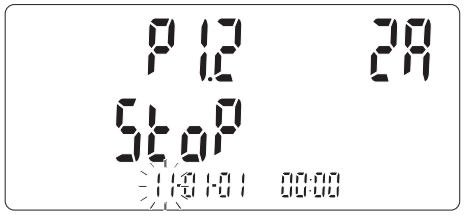


5) When the start date and time is confirmed, the ON or OFF selection screen of the preset stop function appears.



6) Use the [▲] or [▼] key to select "ON", and then press the [ENTER] key. The stop date and time setting display appears. When the preset stop is unnecessary, select "OFF". The preset logging setting screen is resumed.

7) Set the stop date and time in the order of year, month, date, hour and minute.
Use the [▲] or [▼] key to select the value, and then press the [ENTER] key to confirm.
For setting the year, use the lower two digits.
Note: If the preset stop date and time is set earlier than the preset start date and time, an error occurs and the year setting is resumed.



8) Upon completion of setting, press and hold the ESC key for at least two seconds. The RES character lights up to indicate that the preset logging standby mode is set.

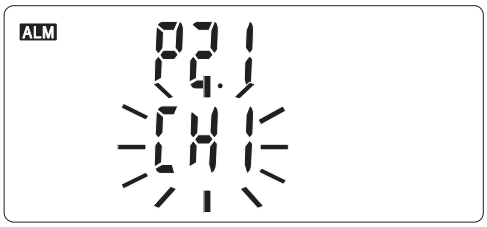
P20 Alarm setting

If the measured value goes out of the set value for the alarm, a buzzer sounds and the LED lamp flashes as a warning. In the alarm function, upper and lower limit values can be set individually for each channel.

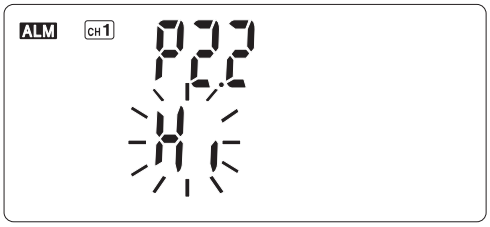
* If the alarm function is not needed, set every setting to OFF. All settings are set to OFF initially.

● Alarm setting

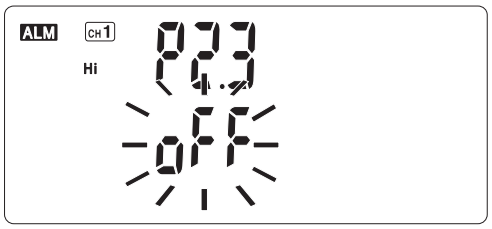
1) Select the P20 alarm setting, and then press the [ENTER] key.
The P2.1 channel selection display appears and the ALM character lights up.



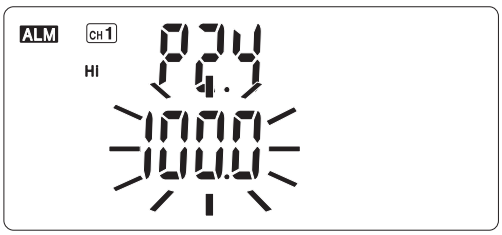
2) Use the [▲] or [▼] key to select the channel for which the alarm is to be set, and then press the [ENTER] key.



3) Use the [▲] or [▼] key to select the upper limit alarm (Hi) or the lower limit alarm (Lo), and then press the ENTER key.
The ON or OFF setting for alarm display appears.



4) Use the [▲] or [▼] key to select "ON", and then press the [ENTER] key to display the alarm value setting.



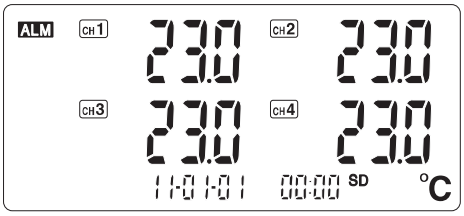
5) Use the [▲] or [▼] key to change the alarm value, and then press the ENTER key to confirm.
Pressing and holding the [▲] or [▼] key quickly advances the value.

Alarm initial value: Hi setting: 100.0°C

Lo setting: 0.0°C

When the alarm value is confirmed, the upper or lower limit selection display is resumed.
For setting the lower limit alarm value, repeat the steps from 3) above.
When setting another channel, first enter the ESC key to return to the channel setting, and then repeat the steps from 2) above.

6) Upon completion of setting, press and hold the [ESC] key for at least two seconds to return to the measurement mode. If the alarm is successfully set, the ALM character lights up in the display.



● Alarm operation

If the measured value exceeds or falls short of the alarm set value, the **Hi** or **Lo** character of each channel flashes, a buzzer sounds and the LED lamp flashes for 30 seconds.
These alarm operations automatically stop after 30 seconds. To stop the alarm mid-way, press any key.
When the alarm is stopped, the **Hi** or **Lo** character stops flashing and remains lit. This indicates that the measured value exceeds or falls short of the alarm set value.
To clear the **Hi** or Lo character, press and hold the [MAX/MIN] key for at least two seconds.
The **Hi** and **Lo** characters are also cleared when entering the setting mode or when the power is turned off.

P30 Offset setting

It is possible to set an offset value in the unit to offset the measured value.
The offset value can be set individually for each channel.

Offset initial value : 0.0°C

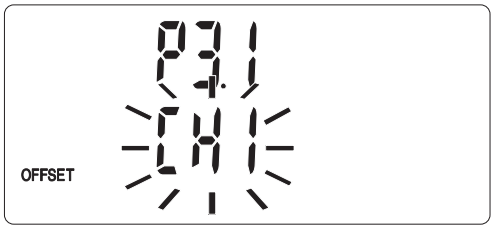
Offset setting range : ±12.0°C

The offset setting is applied to the measured value and the logging data.

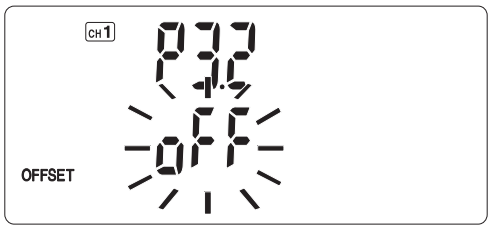
Note: The offset setting is not applied to the data already logged.

● Offset setting

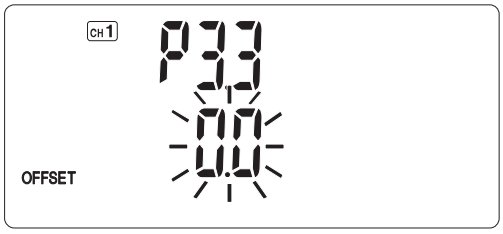
1) Select the P30 offset setting, and then press the ENTER key.
The P31 channel selection display appears, and the **OFFSET** character lights up.



2) Use the ▲ or ▼ key to select the channel for which to set the offset, and then press the ENTER key.
The ON or OFF setting display appears.



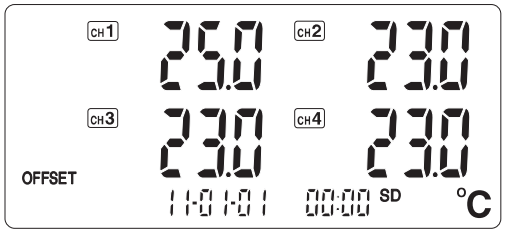
3) Use the ▲ or ▼ key to select "ON", and then press the ENTER key to display the offset value setting.



4) Use the ▲ or ▼ key to change the offset value, and then press the ENTER key to confirm.

5) When the offset value is confirmed, the channel selection display is resumed. For setting other channels, repeat the steps from 2) above.

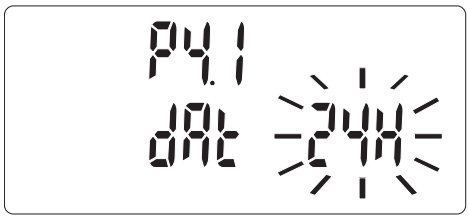
6) Upon completion of setting, press and hold the ESC key for at least two seconds to return to the measurement mode. If the offset is successfully set, the **OFFSET** character lights up in the display.



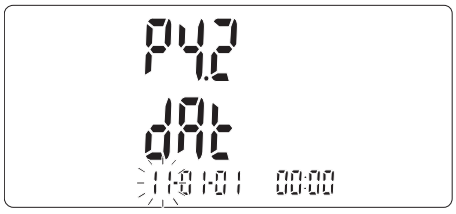
P4.0 Clock setting

This is used to set the clock in the unit.

1) Select the P4.0 clock setting, and then press the [ENTER] key.
The P4.1 clock display format setting display appears.



2) Use the [▲] or [▼] key to select the clock display format, and then press the [ENTER] key.
12H : 12-hour display
24H : 24-hour display



3) Set the date and time in the order of year, month, date, hour and minute.
Use the ▲ or ▼ key to select the value, and then press the [ENTER] key to confirm.
For setting the year, use the lower two digits.

4) Upon completion of setting, press and hold the ESC key for at least two seconds to return to the measurement mode.

Auto power-off function

If no keys are pressed for approximately 20 minutes, the auto power-off function will be activated, turning the power off automatically to prevent unnecessary power consumption caused by forgetting to turn the unit off.

Cancel the auto power-off when continuous measurement is to be performed.

* The auto power-off function is disabled while logging.

● Cancelling the auto power-off function

Make sure that the power is off. Press and hold the Power key for at least two seconds while pressing and holding the [HOLD/T1 – T2/▼] key to turn on the power.

The character appears on the display to indicate that the auto power-off function is cancelled.

Note: The auto power-off cancel setting becomes invalid once the power is turned off.

Set the auto power-off function cancelling every time the power is turned on.

Backlight function

The unit has backlighting to make it easy to read the display even in dark places.

Press the Backlight key while the power is on. The backlight is lit for 10 seconds.

Setting up "4ch DATALOGGER for Windows"

This data analysis software, "4ch DATALOGGER for Windows", can easily create graphs from the data logged with the unit.

Set up the software as described below. For details on how to use it, refer to the Help section.

Before installing the software

- Log on to the computer on which the software is to be installed as Administrator. Contact your system administrator If the computer is managed by a system administrator, and confirm that you can make changes to the system.
- Shut down the anti-virus program or any memory-resident programs before installation.
- Minimum system requirements

Before installing "4ch DATALOGGER for Windows", make sure that your computer meets the minimum system requirements as below.

OS:	Windows 10, 8, 8.1, or 7 (32 bit/64 bit), Windows XP (SP3 or better)
CPU:	Capable of properly running one of the above OSs
Memory:	Capable of properly running one of the above OSs
	For Windows XP, memory of 512MB or more is recommended
	For Windows 7/8/8.1/10, 2GB or more is recommended
Hard disk drive:	150MB or more free space
Internet:	.NET Framework 3.5

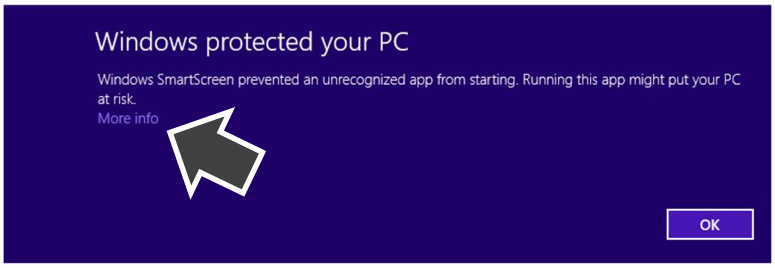
- **Installing software**

1. Confirm the OS (Windows7/8/8.1/10) to be used with your computer and also if its system is 32 bit or 64 bit (Select “System” from “Control Panel” to confirm it)
2. Insert the CD-ROM included with the unit into the CD drive on your computer.
3. Double-click the installer in the CD-ROM to execute the setup. Be sure to check the proper installer to the OS of your computer
   . For 32 bit system or Windows XP: "4ch Datalogger for Windows Ver. 1.1 Setup_32bit.exe"
   . For 64 bit system : "4ch Datalogger for Windows Ver. 1.1 Setup_64bit.exe"
   NB.: The extension of ".exe" may not be displayed depending on the computer settings.

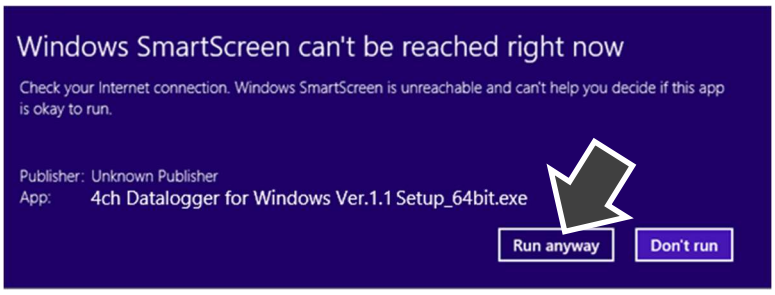
4. Preparing for installation

   1) For Windows 8/8.1/10

   ① The screen below may appear,
   Click “More Info” to display the next screen.
   NB.: This screen may not be displayed depending on the computer settings.

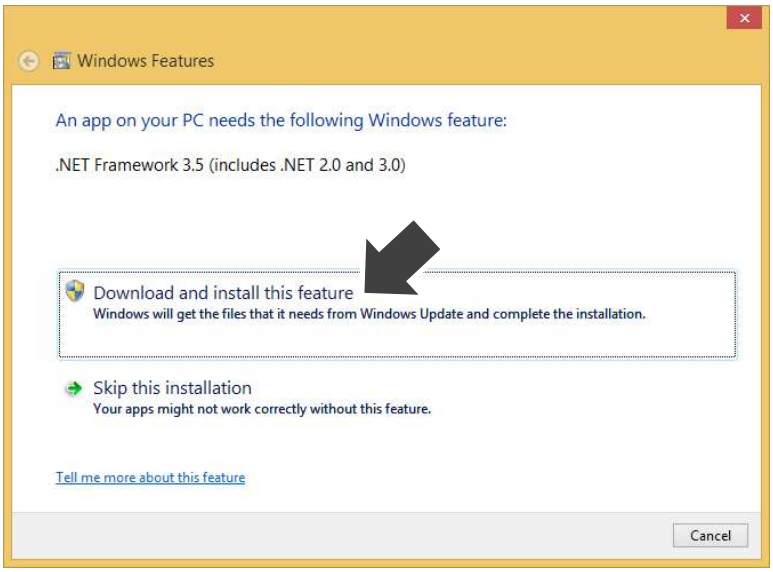


   Click “Run anyway” to proceed.



   ② A confirmation message on User Account Control appears. Click “Yes”
   NB.: This screen may not be displayed depending on the computer settings.

③ Install .NET Framework 3.5. Click “Download and install this feature” in the screen below. Execute the download and installation following the instructions of the screen,



NB. For the installation, your computer should be connected with an internet environment

NB. If Microsoft .NET Framework 3.5 is already installed on your computer, display changes to the startup screen

2) For Windows 7

A confirmation message on User Account Control appears. Click “Yes”

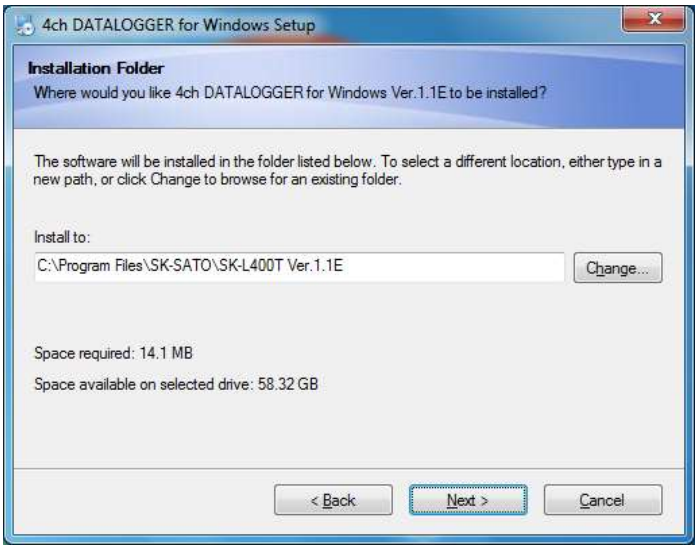
NB.: This screen may not be displayed depending on the computer settings.

5. The startup screen of "4ch DATALOGGER for Windows" appears. . Click "Next".

NB. The message below appears when older version of the application has been installed. Click “OK” to cancel the installation and uninstall the order version. After uninstalling, start again from step No. 4

6. Read the "Software License Agreement" and then If agree, select “I agree to the terms of Software License Agreement". Click "Next" to proceed.

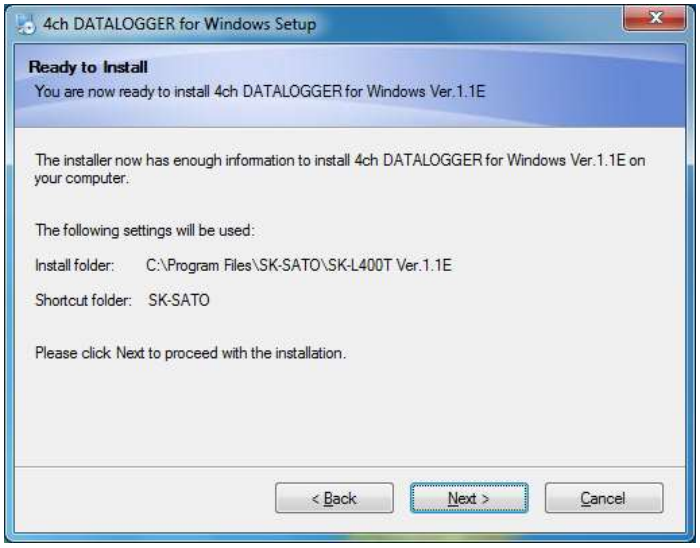
7. Specify the installation location, and then click "Next" to proceed.



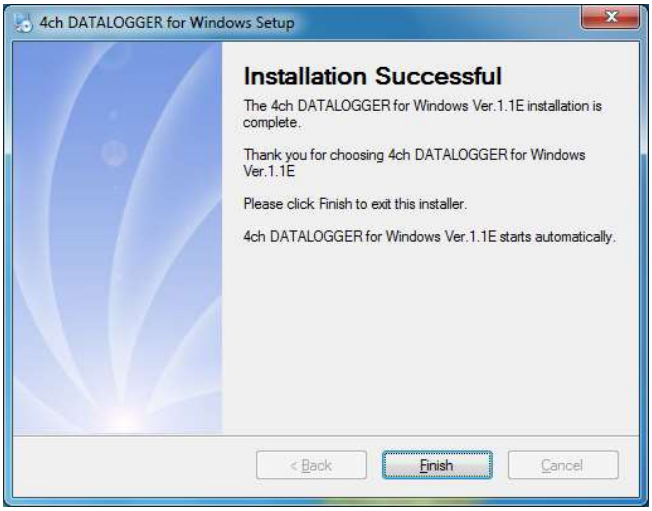
8. The setup wizard appears. Select for which user (only the current user or all users) to create a shortcut in the start menu, and then click "Next" to proceed.

9. Now, the system is ready for installation. Confirm the settings and then click "Next" to proceed.

   The installation starts.



10. Upon completion, the message "Installation Successful" appears. Click "Finish" to start "4ch DATALOGGER for Windows".

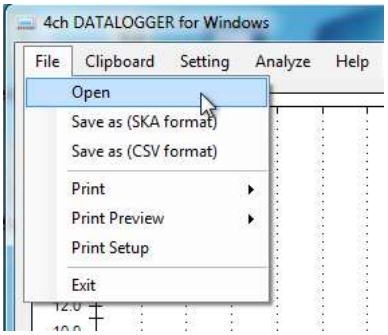


Example of using "4ch DATALOGGER for Windows"

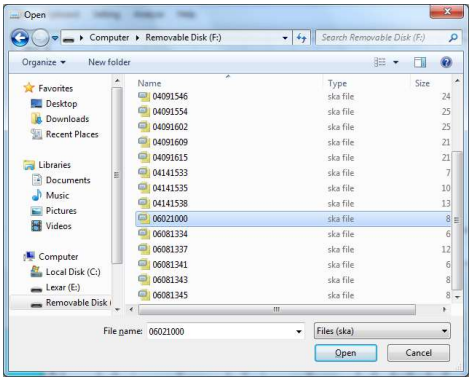
Open the logged data from the software to display graphs.

1) Start "4ch DATALOGGER for Windows".

2) Click "Open" from the File menu on the upper left of the screen.

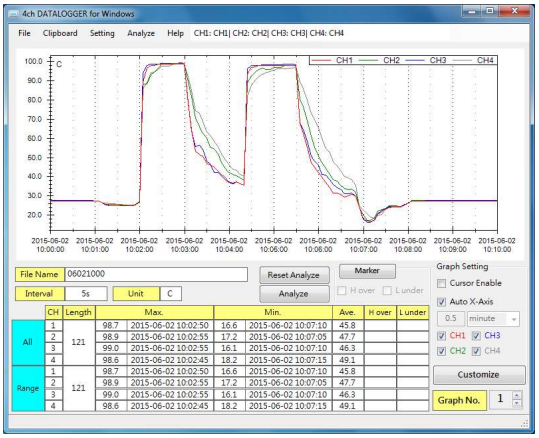


3) Select the file (.ska) to be analyzed, and then click "Open".



4) The program reads the file, then creates and displays a graph.

Note: Refer to the Help section of the software for details on functions and usage.



Error messages

An error code will appear on the display if any error occurs in the unit.

Code	Description	Action
E02	The measured value is below the lower limit of the display range.	Use the unit within the measurement range.
E03	The measured value is above the upper limit of the display range.	
E04	Calculation error. The calculation is performed with the measured value in an error state.	Confirm the probe is properly connected and use the unit within the measurement range.
E07	The measurement environment is below the lower limit of the operating temperature range.	Use the unit within the operating temperature range.
E08	The measurement environment is above the upper limit of the operating temperature range.	
E09	The setting of the preset start/stop date and time is abnormal.	The preset start date and time must be set to later than the current date and time. The preset stop date and time must be set to later than the preset start date and time.
E10	Logging or memo cannot be performed due to lack of space on the SD card.	Turn off the power, free up space on the SD card, release its write-protect (lock), and then reinstall it.
E11	The SD card cannot be recognized. (during preset standby)	Turn off the power and reinstall the SD card. Note: Set the preset logging again if necessary.
E12	The SD card cannot be properly read.	- The SD card may not be properly connected. Turn off the power, check that there is no dust or dirt on the SD card terminals, and then reinstall it. - The SD card may not supported by the unit. See "Installing the SD card".
E13	Logging or memo cannot be performed due to low battery level.	Replace the batteries with new ones.

Troubleshooting

Problem	Possible cause	Action
Power cannot be turned on.	Battery level is low.	Replace the batteries with new ones. See "Installing the batteries" on page 4
	The AD adapter is disconnected.	Properly connect the AC adapter. See "Using the AC adapter" on page 5.
Measurement values are unstable	The unit is used in an environment where electrical noise is generated.	Use the unit and probe away from equipment that produces electrical noise.
	The probe connector is not properly connected.	Properly insert the probe connector all the way. See "Installing the probe" on page 6.
	The unit has not adjusted to the ambient temperature.	Wait until the unit has adjusted to the ambient temperature before starting measurement.
Measurement values are abnormal.	The sensor connected is not a K-type thermocouple.	Connect a K-type thermocouple sensor.
	An offset value has been set.	Check if an offset value is set. See "Offset setting" on page 16.
Display is abnormal.	A malfunction is caused by static electricity or other reason.	Stop logging if logging is in progress. Push the reset switch on the back of the unit with a thin pin or the like to reset the unit. The clock setting is reset; set the clock again. Other settings such as the logging interval are retained.

NB. If none of these actions works, contact us or the store where you purchased the unit.

Specifications

Catalog No. / Product	No. 8191-00 4-ch Datalogger
Model	SK-L400T
Sensing element	K type thermocouple Allowable signal source resistance: 200 ohm Connecter: ASTM (former ANSI) miniature connector for thermocouple
Number of channels	4 channels
Display range	−202.0 to 1,372°C
Temperature coefficient	±(0.01%rdg + 0.1)°C/ °C (at other than 18 to 28°C)
Resolution	0.1°C at -202.0 to 999.9°C 1°C at other than above
Display accuracy	±(0.3%rdg + 1)°C within 23°C ±5°C * Measuring accuracy depends on the probe connected. * +2%rdg of error is added when connected with a surface probe.
Display sampling	Approx. 1 second
Logging interval	In seconds (1, 2, 5, 10, 15, 30) and in minutes (1, 2, 5, 10, 15, 30, 60, 90)
Operating ambient	0 to 50°C, lower than 85%rh (no condensing)
Storage ambient	0 to 50°C, lower than 85%rh (no condensing)
Power requirement	4 AA alkaline batteries or nickel-hydrogen batteries, AC adapter (optional)
Battery life	Approx. 500 hours In use of alkaline batteries under nomal temperature at 1-minute interval (backlight: OFF, display: OFF)
Weight	420 g (with batteries)
Dimensions	Approx. 158 (W) × 106 (H) × 40 (D) mm
Material	ABS resin
Accessories	- CD-ROM (data analysis software) 1 - AA alkaline batteries 4 - SD card 1 - Carrying case 1 - Instruction Manual 1

NB. All specifications subject to change without notice.

* Option:

No. 8191-90 AC adapter for exclusive use with SK-L400T

No. 8191-92 Water protection box

NB. As for the probes and connector, contact us or the shop you purchased from.